Synthetic Environment (SE) Core
Leadership Development Seminar
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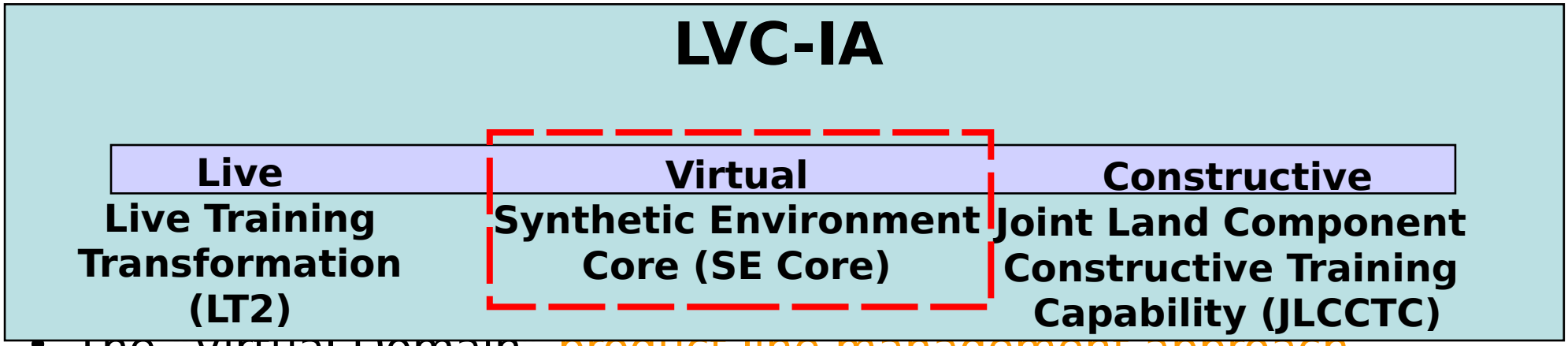
Agenda

- Synthetic Environment (SE) Core Overview
- Architecture & Integration (A&I)
  - OneSAF Objective System (OOS) Integration
  - Virtual Simulation Architecture (VSA)
  - Common Virtual Components (CVC)
- SE Core Database Virtual Environment Development (DVED)
  - Standard/Rapid Terrain Database Capability (STDGC)
  - Master Database (MDB) Centers
  - Common Moving Models (CM2)
- Summary

The "V" in Live, Virtual, Constructive Integrating Architecture (LVC-IA)

- Acquisition program to meet the requirements of the Army-endorsed Operational Requirements Document (ORD). The SE Core ORD is **Joint Certified** and was approved by the Army on 3 February 2005



- The "Virtual Domain" product line management approach integrated with the Army's LVC simulation initiative

SE Core Mission

Support the Training of our Warfighters by providing:

- The development of a Virtual Simulation Architecture (VSA) to provide a ***Common Virtual Environment (CVE)*** that links system and non-system simulations into a fully integrated and interoperable training capability.

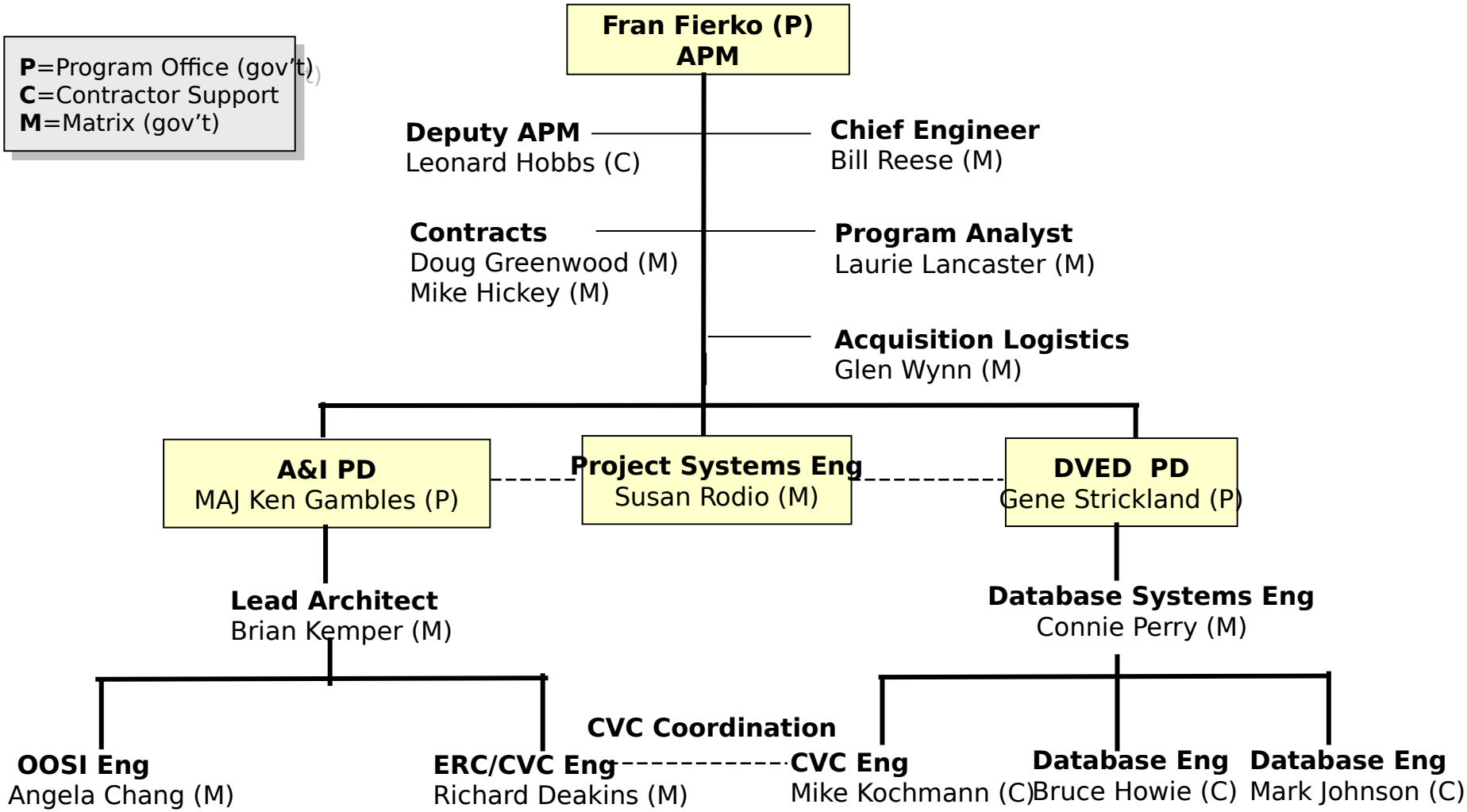
- ***OneSAF Objective System (OOS) Integration*** into AVCATT and CCTT and the development of virtual OOS composition as the standard computer generated forces for the virtual domain.

- Development of ***Common Virtual Components (CVC)*** that will reduce redundancy, increase realism, and facilitate an integrated live, virtual, constructive training environment. (LVC TE)

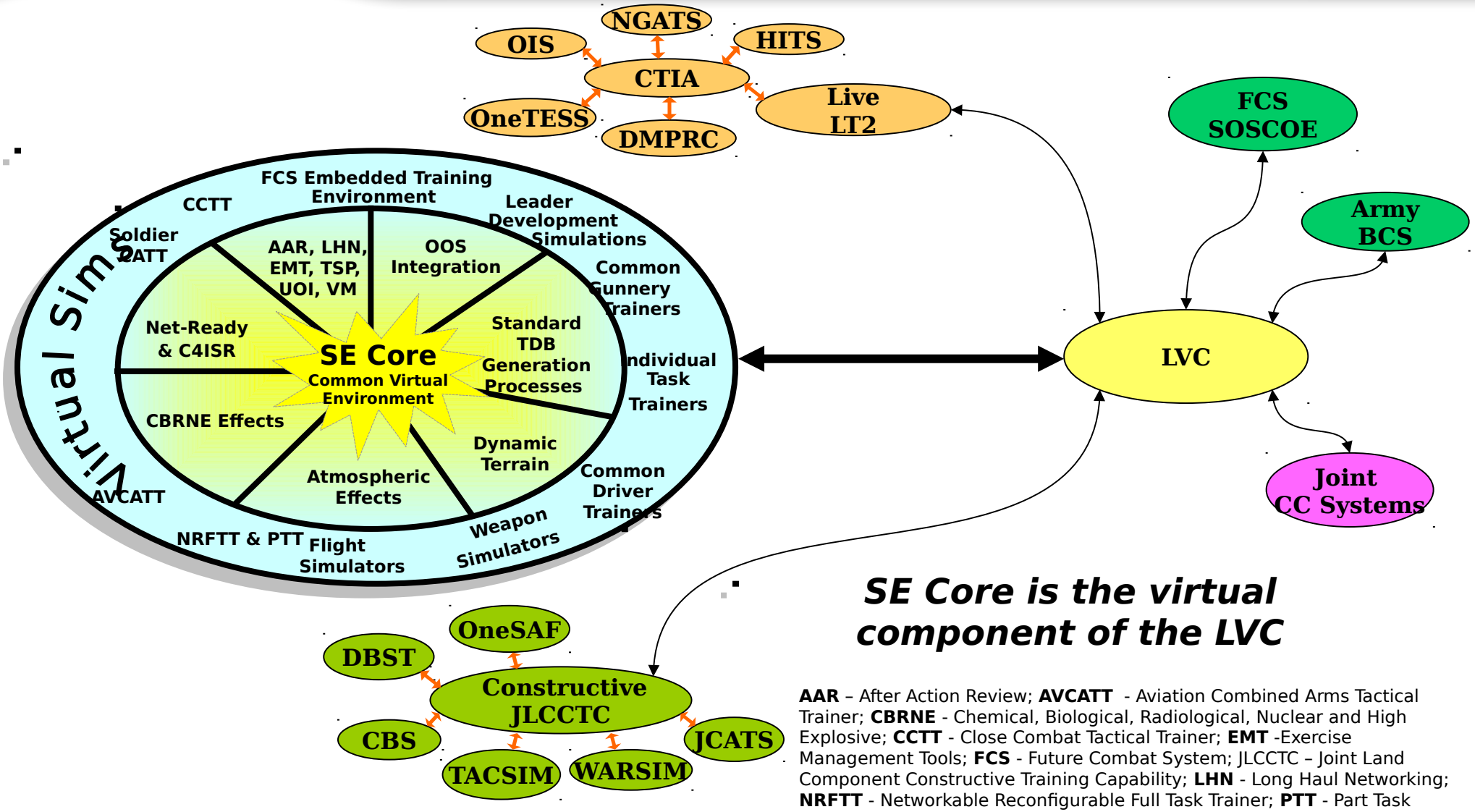
- Development of a standard ***Terrain Database (TDB) generation process*** to create a non-proprietary, open format, image generator (IG) independent, Master TDB (MTDB) consumable by virtual simulations, within a total development time of 96 hours.

Organization Chart

P=Program Office (gov't)
C=Contractor Support
M=Matrix (gov't)



SE Core Operational *View*



SE Core is the virtual component of the LVC

AAR – After Action Review; **AVCATT** - Aviation Combined Arms Tactical Trainer; **CBRNE** - Chemical, Biological, Radiological, Nuclear and High Explosive; **CCTT** - Close Combat Tactical Trainer; **EMT** -Exercise Management Tools; **FCS** - Future Combat System; JLCCTC – Joint Land Component Constructive Training Capability; **LHN** - Long Haul Networking; **NRFTT** - Networkable Reconfigurable Full Task Trainer; **PTT** - Part Task Trainer; **TDB** – Terrain Database; **TSP** - Training Support Package; **UOI** - Urban Operations Insets; **VM** – Visual Models

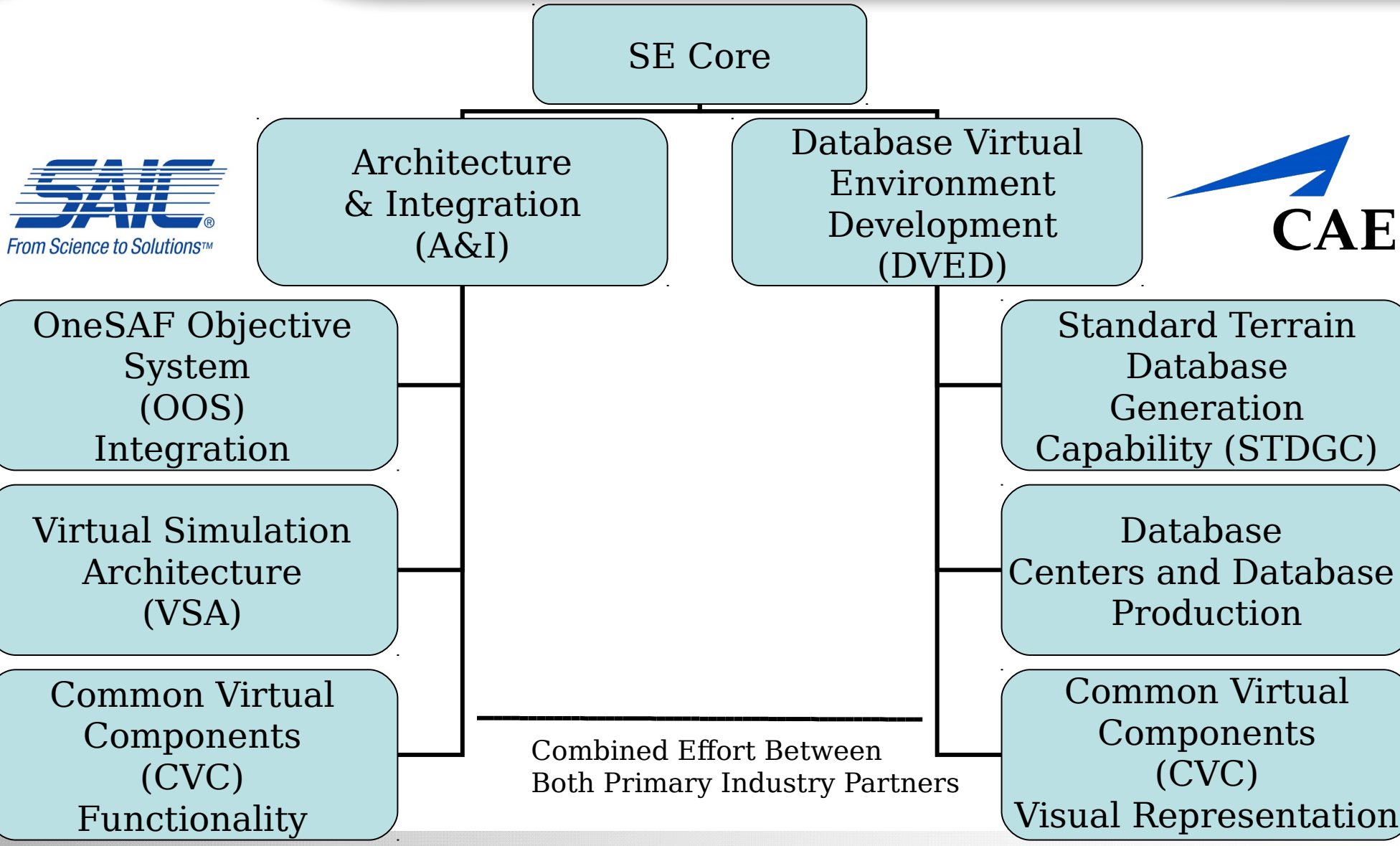
SE Core Requirements

SE Core is an acquisition program to meet the requirements of the Army-endorsed ORD.

KPP 1. OneSAF Objective System (OOS) Integration into CCTT and AVCATT
KPP 2. Standard Rapid Terrain Database Generation Capability
KPP 3. Dynamic Terrain
KPP 4. Atmospheric Effects
KPP 5. Net-Ready
KPP 6. Command, Control, Communications, Computers, Intelligence, Surveillance, Reconnaissance (C4ISR)

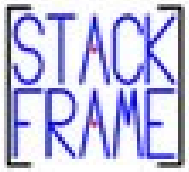
Database Centers
Visual Models
Urban Operations Insets
After-Action Review (AAR)
Long Haul Networking
Exercise Management Tools
Training Support Package
Chemical, Biological, Radiological, Nuclear and High Explosive Environment (CBRNE)
Virtual Simulation Architecture

Functional Breakdown


SE Core
Architecture & Integration (A&I)
Database Virtual Environment Development (DVED)
SAIC From Science to Solutions™
CAE
OneSAF Objective System (OOS) Integration
Virtual Simulation Architecture (VSA)
Common Virtual Components (CVC) Functionality
Standard Terrain Database Generation Capability (STDGC)
Database Centers and Database Production
Common Virtual Components (CVC) Visual Representation
Combined Effort Between Both Primary Industry Partners

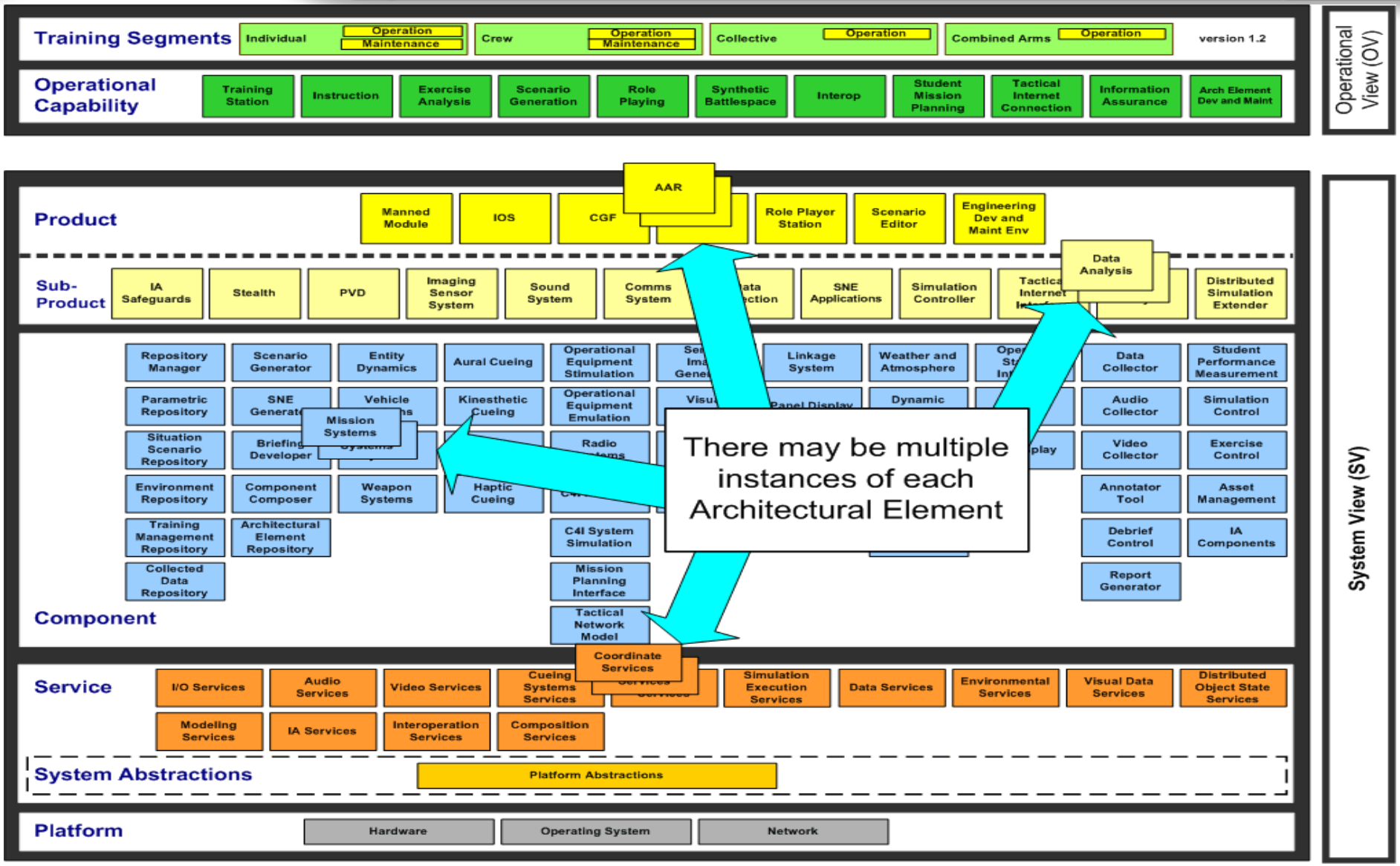
A&I Stakeholders

A&I Industry Partners

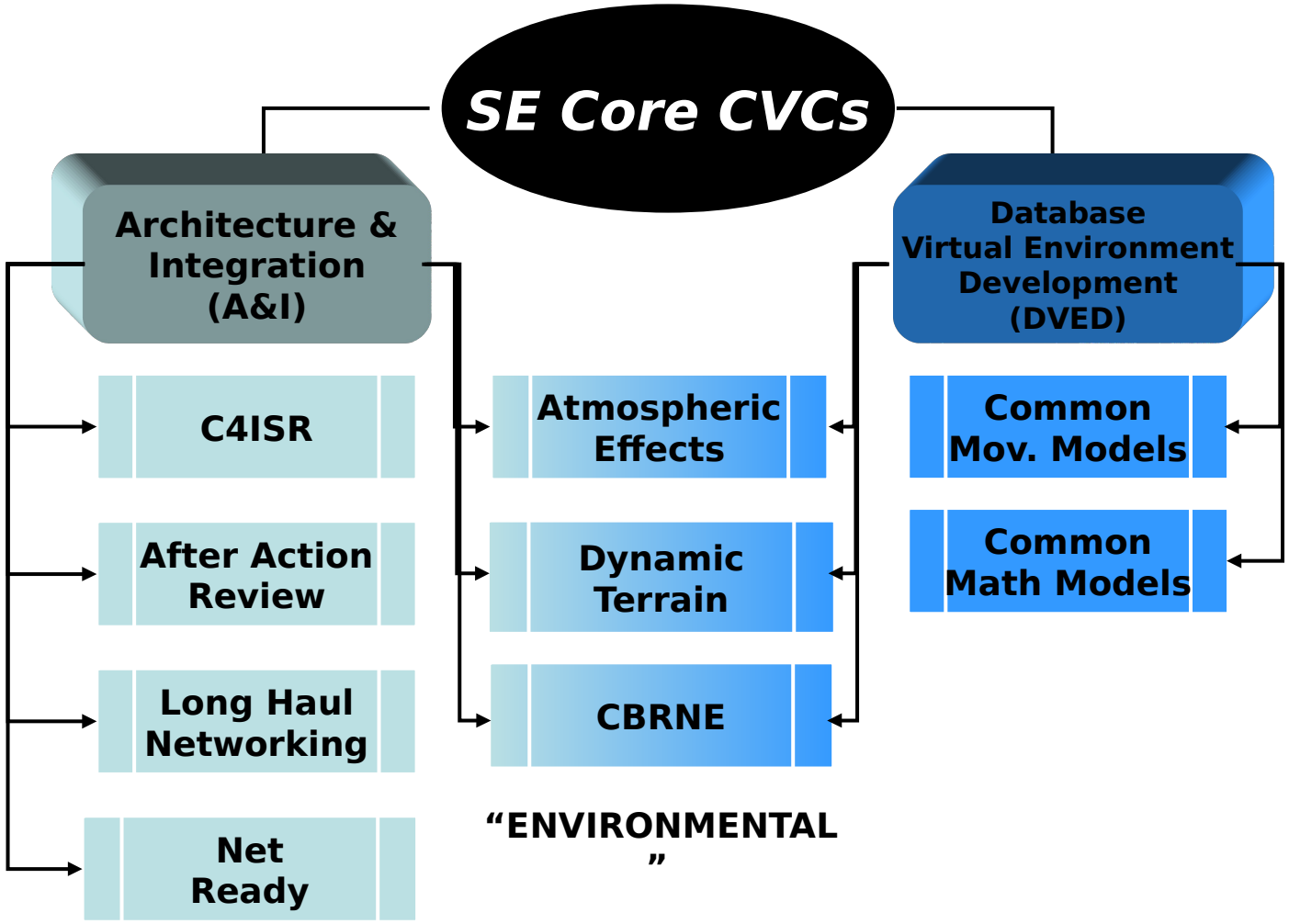


OneSAF Objective System (OOS) Integration

Virtual Simulation Architecture (VSA)



CVCs Cross the SE Core Domains



DVED Stakeholders

VIRTUAL SIMULATIONS

TPO Virtual

CCTT

PROJECT MANAGER CONSTRUCTIVE SIM

U.S. Army Corps of Engineers
Engineer Research and Development Center
TOPOGRAPHIC ENGINEERING CENTER

ESSAYONS

TPIO-TD

PRODUCT MANAGER
Team GCTT
GROUND COMBAT TACTICAL TRAINERS

PM ACTT
PRODUCT MANAGER AIR AND COMMAND TACTICAL TRAINERS
Soldiers the bottom line...!

FUTURE COMBAT SYSTEMS
FCS
One Team-The Army/Defense Industry

NIGHT STALKERS

NPSI

160th SOAR

PM STS
SOF TRAINING SYSTEMS

MARINES
THE FEW. THE PROUD.

AIR FORCE RESEARCH LABORATORY

AFRL

BCOE

SFC Paul Ray Smith Simulation & Training Technology Center
Leadership & Education
Training
Personnel
Test & Evaluation
Facilities
Master Planning
Doctrine
Organizations
Training
Battle Command
Mission Rehearsal
Material
VIRTUAL
CONSTRUCTIVE
LIVE
Simulation Enabled Learning

CONQUEST OF DARKNESS

NVL

UNITED STATES JOINT FORCES COMMAND
USJFCOM

Joint/Army Geospatial Data Enhancement

DVED Industry Partners

CAE

TERREX TERRAIN EXPERTS, INC.

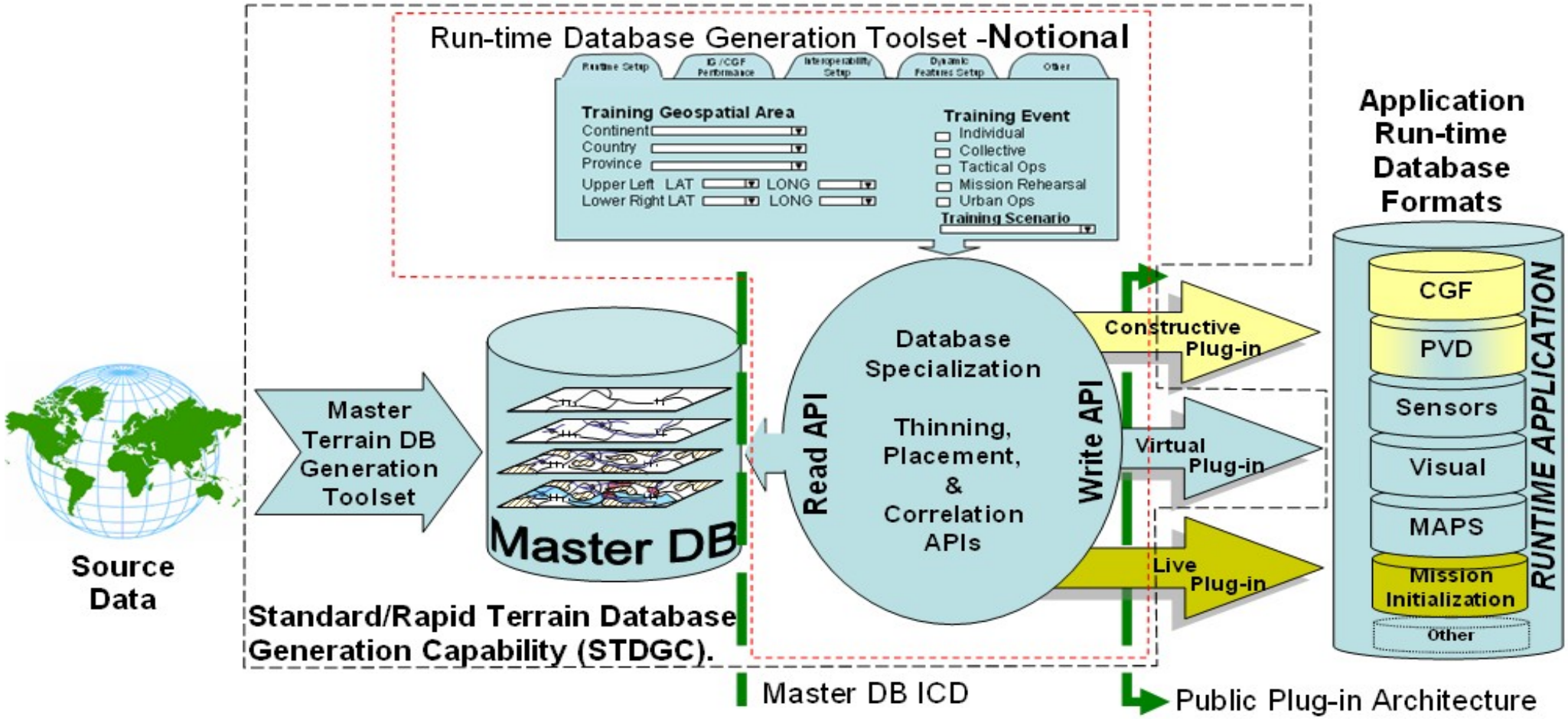
LOCKHEED MARTIN

Rockwell Collins

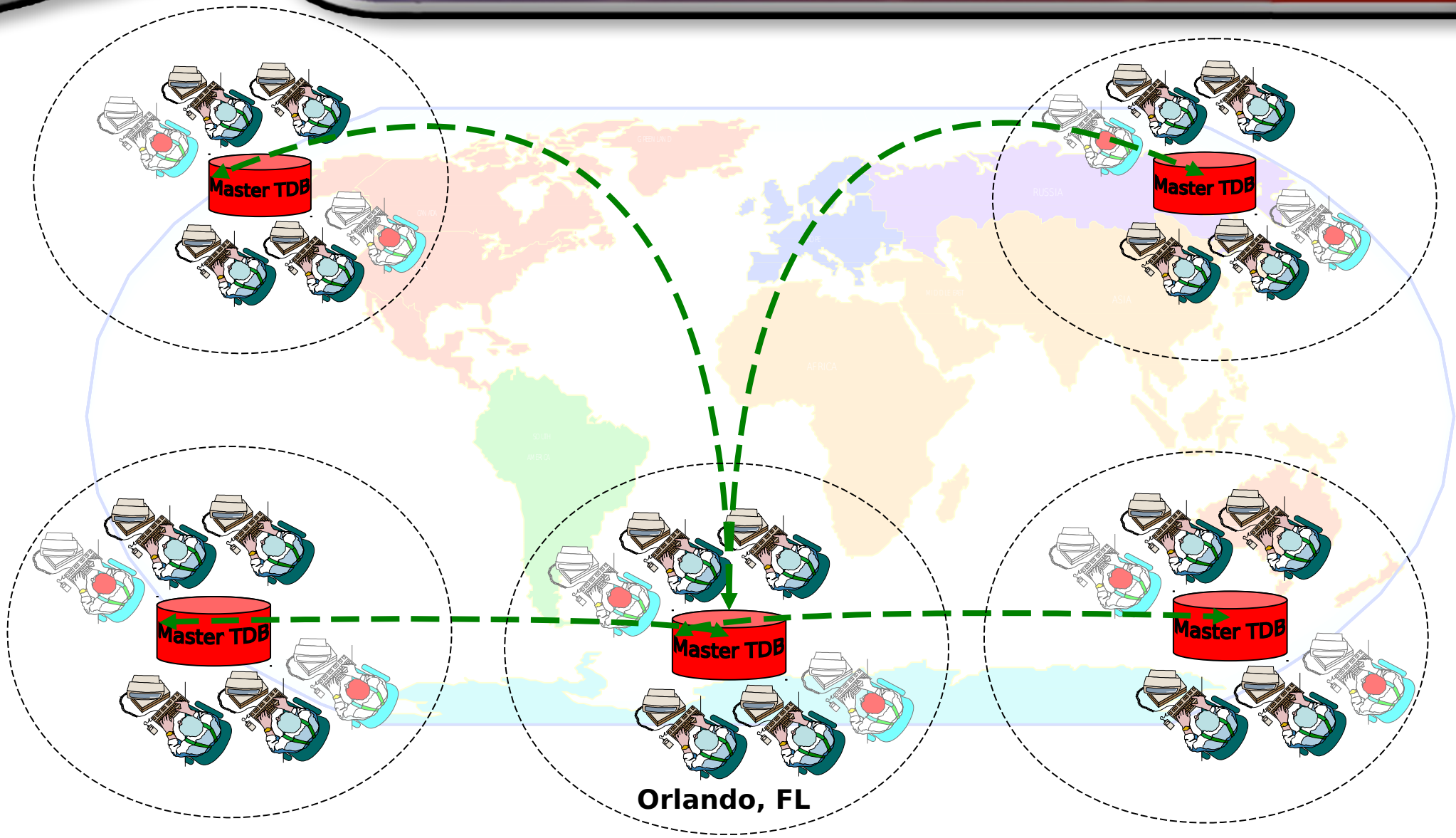
ARINC YOU WON'T BELIEVE WHAT WE CAN DO.®

SECUREINFO

STDGC Process



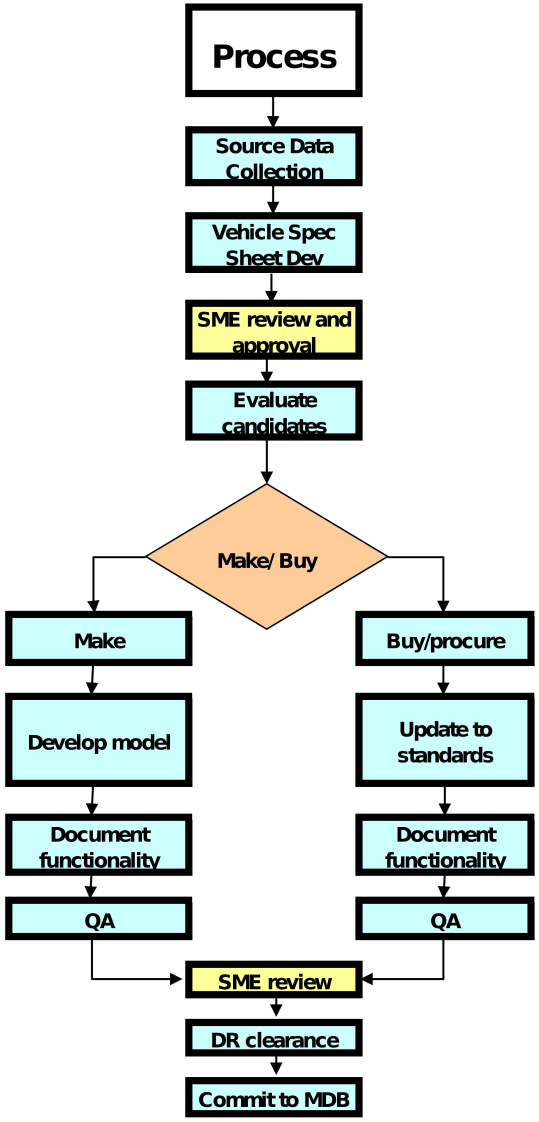
Master Database (MDB) Generation Centers



CM2 Requirements

Common Moving Models (CM2)

- Phase I Set of 36 Models
  - Developed for CCTT
  - Delivered by Jan 2007
  - Transferred to CAE for configuration management control
- Phase II Set of 240 Models (8 Lots of 30)
  - Developed by CAE
  - Delivered in Oct 2007



SE Core Benefits

- ✓ **Supports Live-Virtual-Constructive (LVC)**
  - Interoperability
  - Common Terrain
  - Common Products
- ✓ **Virtual Simulation Architecture (VSA) Development**
  - Architectural standard solution for virtual domain.
  - Promotes reuse and interoperability for virtual simulations.
- ✓ **Common Virtual Component (CVC) Development**
  - Cost savings to customer by reuse and standardization (AAR, C4ISR, exercise management).
  - Training Support Packages for full-spectrum training requirements.
  - Streamlined acquisition and development process.
  - Feeds PEO STRI Common Product Component (CPC) repository.
- ✓ **Future Combat System (FCS)**
  - Terrain database processes.
  - Virtual products for embedded training.
  - Interoperability with current simulations.
- ✓ **ONESAF Objective System (OOS) Integration**
  - Facilitates interoperability between virtual systems, LVC, and the Future Combat System.
  - Facilitates training in the Contemporary Operational Environment (COE).
  - Provides a common SAF across the virtual domain.
  - Cost savings as a result of a common SAF baseline.
- ✓ **Database Virtual Environment Development (DVED)**
  - Rapid terrain database development (96 hours) supports contingency planning and mission rehearsal.
  - Available correlated terrain databases across LVC.
  - High fidelity terrain databases that replicate Chemical, Biological, Radiological, Nuclear and High Explosive (CBRNE) atmospheric effects.
  - Urban operations, complex, and dynamic terrain.
  - Significant cost savings through database reuse for multiple, virtual simulators.

BACK-UP SLIDES

A&I Program Collaboration

Organization	SE Core Support/Collaboration Provided
PM Special Operations Forces Training Systems	• Provided an SE Core brief to the USSOCOM MTPS Architecture & Technology Standards working group • Provided DoDAF architecture artifacts to support their CDD development efforts
PM Warrior Trainer Integration	• Provided support to LVC-IA Capabilities refinement crosswalk • Provided guidance/input/lessons learned to development of milestone package • Supported Joint AAR TIM
PM Future Force (Simulation)	• Briefed Future Combat Systems Training Common Components (FCS TCC) council on SE Core status of common component efforts.
APM Close Combat Tactical Trainer	• Provided DoDAF architecture artifacts to be leveraged by CCTT in the development of their ISP

A&I Program Collaboration

Organization	SE Core Support/Collaboration Provided
PM Air and Command Tactical Trainers	• Provided SE Core Brief to PM ARH • Provided PM ARH interoperability design requirements support • Provided DoDAF architecture artifacts to be leveraged by AVCATT in the development of their ISP
PM Live Training Transformation (LT2)	• Provided virtual domain requirements, use cases and support to PEO STRI AAR PIE effort • Web Portal reuse/leveraging opportunities
PM GCTT	• Providing support to Stryker Mobile Gun System Advanced Gunnery Training System (MGS AGTS)
PM OneSAF **PM WARSIM**	• Converted and extended the WARSIM-based code to OOS/ERC to provide a graphical test environment

DVED Program Collaboration

Organization	SE Core Support/Collaboration Provided
PM Special Operations Forces Training Systems	• Attended Common Database (CDB) working group meeting, Tampa, FL, Mar 2006 • Attended several IPRs and demonstrations on TERREX Supervisor tool development, Hurlburt, FL and Orlando, FL • Attended ASTARS04 Program Progress Review, Tampa, FL
PM Future Force (Simulation)	• Attended FCS - NGA Environment Meeting @ U.S. Army Topographical Engineering Center (TEC), Alexandria, VA • Briefed FCS Geospatial Working Group • Briefed Future Combat Systems Training Common Components (FCS TCC) council on SE Core database efforts.
University of West Florida	• Dr. Bitter's briefing on Advanced Simulation Database Generation Technologies.
IMAGE 2006	• Participated on Database panel at IMAGE conference, Scottsdale, AZ, July 2006

DVED Program Collaboration

Organization	SE Core Support/Collaboration Provided
PEO Aviation	• Briefed SE Core to PEO Aviation, Huntsville, AL
Terrain Experts, Inc.	• Participated on TERREX User Advisory Board, Tucson, AZ

RDECOM-STTC	• Provided funding and support on multiple Broad Agency Announcements (BAA) to include the following:
	  • Rapid Unified Generation of Urban Databases (RUGUD)
	  • Urban and Underground Model Generator (U2MG)
	• Received support from RDECOM-STTC on SE Core efforts

Joint Forces Command	• Participated in Joint Rapid Distributed Database Development Capability (JRD3C) Working Conferences, Integrated Product Team meetings and teleconferences, Colorado Springs, CO and Boston, MA
Air Force Research Laboratory &	• Finalized contract through NAVAIR TSD with AFRL to develop common math models for sensor representations and material definitions

DVED Program Collaboration

Organization	SE Core Support/Collaboration Provided
PEO STRI (PM CATT), **TPIO-V,** **US Army Infantry School,** **US Army Armor School,** **US Army Aviation Center, Directorate of Simulation** **US Marine Corps Systems Command (MARCORSYCOM), PM TRASYS,** **TRADOC DCSOPS&T,** **TRADOC Capability Manager Platform Battle Command and Combat Identification,** **Night Vision and Electronic Sensors Directorate,** **CAE USA,** **Rockwell Collins**	• SE Core chairs the Common Moving Model (CM2) IPT with membership from these organizations. IPT meetings are held bi-weekly.